Multi-Sensor Geospatial Data Integration for Coastal Erosion Analysis

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ABSTRACT:

Coastal erosion analysis is critical for coastal disaster mitigation, environmental protection, resource management, and coastal development decision making. Recent advances in geospatial technologies such as spaceborne and airborne remote sensing, hydrodynamic surveying, and data integration technologies have dramatically changed the density, accuracy, timeliness, and inherent nature of coastal monitoring and mapping. Huge amounts of multi-sensor coastal geospatial data, such as satellite and aerial imagery, satellite altimetry, water-penetrating LiDAR bathymetry, observations from water gauge stations, meteorological data, and miscellaneous in-situ observations have been gathered by government agencies, non-governmental organizations, and academic institutions. This paper presents the strategies for the integration of multi-sensor geospatial data for coastal erosion analysis. A number of different methods to extract coastlines are examined using various combinations of heterogeneous coastal geospatial data. Comparisons of digital coastlines at different timeslots are performed to evaluate the coastal erosions. Application of these methods to the data collected at experiment sites at Lake Erie, Ohio, and Hong Kong Island is given.